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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/025,492	12/26/2001	Hiroyuki Hattori	02860.0700	7896

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EXAMINER

LAVARIAS, ARNEL C

ART UNIT PAPER NUMBER

2872

DATE MAILED: 03/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

Office Action Summary	Application No. 10/025,492	Applicant(s) HATTORI ET AL.	
	Examiner Arnel C. Lavarias	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2 and 4-8 is/are pending in the application.
- 4a) Of the above claim(s) 6-8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4 and 5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The amendments to Claim 1 in the submission dated 12/23/04 are acknowledged and accepted.
2. The cancellation of Claim 9 in the submission dated 12/23/04 is acknowledged and accepted.

Response to Arguments

3. The Applicants' arguments filed 12/23/04 have been fully considered but they are not persuasive.
4. The Applicants argue that, with respect to newly amended Claim 1, the combined teachings of Shiao et al., Meyers, and Ueda et al. fail to teach or reasonably suggest an optical element molded between a first die and a second die, wherein the second edge portion of the flange surface is positioned at the partition line between the first die and the second die. The Examiner respectfully disagrees. Looking specifically at Figure 2 or 4 of Shiao et al., Shiao et al. discloses a first die (See for example 4 in Figure 2) and a second die (See for example 10 in Figure 2) which are jointed along a partition line (See partition between 4 and 10 in Figure 2); the optical element comprising a convex first optical surface (See surface of optical element near 6 in Figure 2); a second optical surface being a refractive surface opposite to the first optical surface (See surface of optical element near 40 in Figure 2); a flange (See regions filled in with resin at 18 and 8

in Figures 2, 4) having a flange surface provided around a periphery of the optical element, a first edge portion (See for example upper horizontal portion of flange at 18 in Figure 4) of the flange surface adjoining to the first optical surface and a second edge portion (See for example vertical and lower horizontal portion of flange at 18 in Figure 4) of the flange surface adjoining to the second optical surface (See Figure 3 specifically), wherein the second edge portion is positioned at the partition line between the first die and the second die (It is noted that both the first and second edge portion of the flange surface are positioned and intersect at the partition line, as seen in region of 18 in any of Figures 1-4).

5. The Examiner further notes that features upon which Applicants rely in their remarks and arguments (e.g. separation of die surfaces leading to damage or distortion of diffractive surfaces, various method of molding or forming the diffractive optical element) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).
6. Finally, in response to Applicants' argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the combined teachings

Art Unit: 2872

allows one of ordinary skill in the art to fabricate a diffractive optical element, wherein the diffractive optical surface is provided on one surface of the optical element which is convex in curvature. Further, incorporating diffractive surfaces onto concave or convex refractive surfaces of optical elements such as lenses is well known and conventional in the art. Ueda et al. specifically mentions that diffractive surfaces may be incorporated onto the surfaces of optical elements such as refractive lenses to greatly increase the numerical aperture, particular in applications wherein space is limited and very small focal spots sizes are required (e.g. optical pickup heads) (See for example col. 1-col. 3 of Ueda et al.). Similarly, Meyers provides reasoning for incorporating diffractive surfaces onto the surfaces of refractive lenses (e.g. improved chromatic correction, smaller size and weight, fewer elements used; See col. 2-col. 3 of Meyers).

7. Claims 1-2, 4-5 are rejected as follows.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiao et al. (U.S. Patent No. 5415817), of record, in view of Meyers (U.S. Patent No. 5543966), of record, and Ueda et al. (U.S. Patent No. 6215591), of record.

Shiao et al. discloses an optical element (See Figure 2, 4) molded between a first die (See for example 4 in Figure 2) and a second die (See for example 10 in Figure 2) which are jointed along a partition line (See partition between 4 and 10 in Figure 2), the optical element comprising a first optical surface (See surface of optical element near 6 in Figure 2); a second optical surface (See surface of optical element near 40 in Figure 2) being a refractive surface opposite to the first optical surface; a flange (See regions filled in with resin at 18 and 8 in Figures 2, 4) having a flange surface provided around a periphery of the optical element, a first edge portion (See for example upper horizontal portion of flange at 18 in Figure 4) of the flange surface adjoining to the first optical surface and a second edge portion (See for example vertical and lower horizontal portion of flange at 18 in Figure 4) of the flange surface adjoining to the second optical surface (See Figure 3 specifically), wherein the second edge portion is positioned at the partition line between the first die and the second die (It is noted that both the first and second edge portion of the flange surface are positioned and intersect at the partition line, as seen in region of 18 in any of Figures 1-4). Meyers additionally discloses the optical element having an optical axis (See optical axis of the optical element is taken to be an imaginary vertical line running vertically through the center of the optical element and in the plane of the page of Figure 2) and the flange surface being parallel to the optical axis (See Figure 3); and the first surface being a convex surface (See 6 in Figure 2). Shiao et al. lacks a diffractive structure provided on the convex optical surface. However, Meyers teaches an optical element molded between a first die and a second die which are jointed along a partition line (See Figures 2 and 24), comprising a first optical surface on which a

diffractive structure is provided (See 3 of Figure 2; S2 of Figure 24 for example); a second optical surface being a refractive surface opposite to the first optical surface (See 1 of Figure 2; S1 of Figure 24 for example); a flange having a flange surface provided around a periphery of the optical element (See upper and lower edge portions of element 10 in Figure 2; see upper and lower edge portions of molded element in Figure 24), a first edge portion of the flange surface adjoining to the first optical surface and a second edge portion of the flange surface adjoining to the second optical surface (See Figure 2 specifically); and the diffractive structure of the first optical surface being shaped in a plurality of ring-shaped diffractive zones (See Figures 2 and 3 for example), such as a plurality of ring-shaped steps (See 3 in Figure 4; Figure 5A). The combined teachings of Shiao et al. and Meyers lack the first surface being the convex surface on which the diffractive structure is provided. However, it is well known in the art that diffractive structure may be provided on one or both surfaces of a lens to produce a diffractive optical element. For example, Ueda et al. teaches a conventional diffractive optical element functioning as a lens (See for example Figure 4), wherein both surfaces, and in particular the convex surface, of the lens incorporates diffractive grating structure (See 20, 21 in Figure 4). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have a diffractive structure provided on the convex optical surface, as taught by Meyers and Ueda et al., for the purpose of providing enhanced optical characteristics to the lens, such as higher numerical aperture or variable focal length.

10. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiao et al. in view of Meyers and Ueda et al.

Shiao et al. in view of Meyers and Ueda et al. discloses the invention as set forth above in Claim 1, except for the diffractive structure of the first optical surface being shaped in a plurality of ring-shaped diffractive zones, such as a plurality of ring-shaped steps. However, the use of ring-shaped diffractive zone, such as a plurality of ring-shaped steps in diffractive optical elements is well known in the art. For example Ueda et al. additionally discloses the diffractive structure of the first optical surface being shaped in a plurality of ring-shaped diffractive zones (See Figures 2 and 3 for example), such as a plurality of ring-shaped steps (See 3 in Figure 4; Figure 5A). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the diffractive structure of the first optical surface being shaped in a plurality of ring-shaped diffractive zones, such as a plurality of ring-shaped steps, as further taught by Ueda et al., for the purpose of providing appropriate adjustment of the diffraction efficiencies of the various diffraction orders of the diffractive structure to achieve a particular function, such as increase light convergence.

11. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiao et al. in view of Meyers and Ueda et al. as applied to Claim 1 above, and further in view of Maruyama (U.S. Patent No. 5978140), of record.

Shiao et al. in view of Meyers and Ueda et al. discloses the invention as set forth above in Claim 1, except for the flange having a side surface at the second edge portion and the side surface being tapered from the second edge portion. However, Maruyama

teaches a method for designing a diffractive lens (See Figure 1a-c) wherein the optical element includes a flange (See upper and lower edge of optical element of Figure 1b, specifically the edge in the region near 10) having a side surface at the second edge portion and the side surface being tapered from the second edge portion (See tapered flange sections on upper and lower edge of optical element of Figure 1b, particularly the edge to the left of 12). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the flange have a side surface at the second edge portion and the side surface be tapered from the second edge portion, as taught by Maruyama, in the molded optical element of Shiao et al. in view of Meyers and Ueda et al. for the purpose of providing additional mounting stability and additional surface area for handling of the optical element.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 2872

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 571-272-2315. The examiner can normally be reached on M-F 9:30 AM - 6 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Arnel C. Lavarias
3/11/05



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